Application of

buildingSMART™

to Foster Enhanced Building Safety

Building and Fire Research Laboratory

Fire Research

NIST National Institute of Standards and Technology

Annual Fire Conference

Dave Conover

April 5, 2007

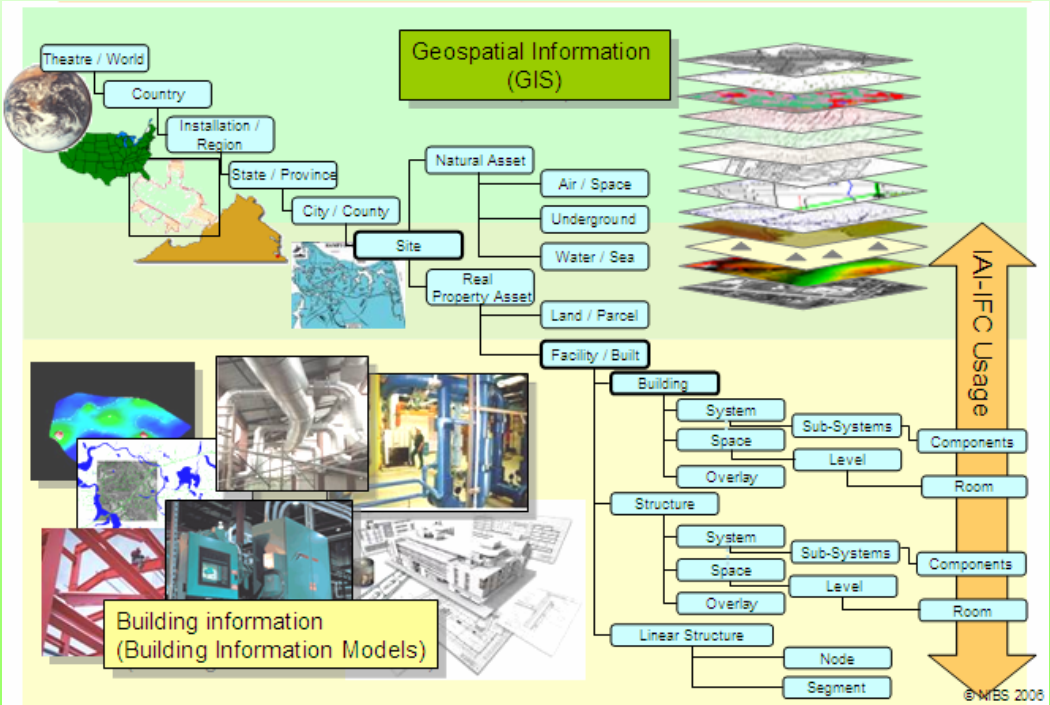
ICC INTERNATIONAL CODE COUNCIL®

Vision

....the dynamic and seamless exchange, updating and maintenance of accurate, useful information on the built environment among all members of the building community throughout the lifecycle of a facility

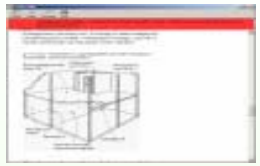
….a smarter process for managing the lifecycle of a project to enhance public safety

….continual access to and sharing of information about a building

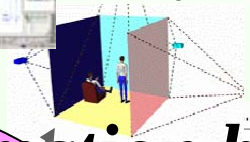


Interoperability

Rules and Regulations
Bldg, H&S, Planning



BIM software
Arch, Struct, Eng Services
Civ Eng

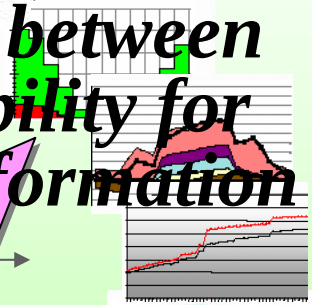


VRML
Visualisation
3D models

Knowledge databases
Company
External

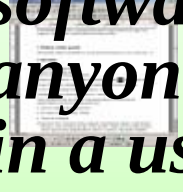
IFC

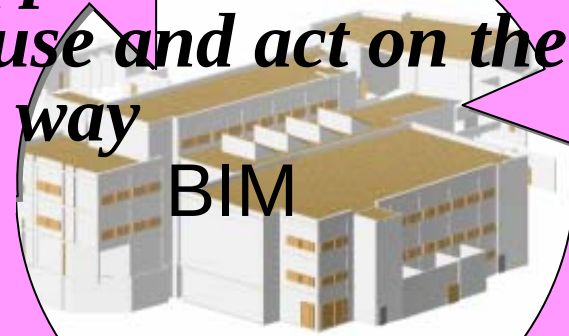
Communication of information between software applications and the ability for anyone to use and act on the information in a useful way



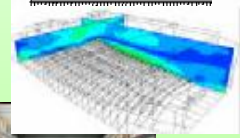
Simulation
Comfort
Air, heating
Lifecycle costs
Light and sound
Insulation
Use
Fire
Environmental impact
Life expectancy

Functional description
Functions
Calculations
Requirements
Constraints

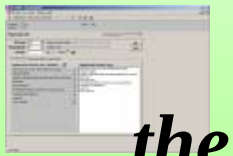




BIM



Reuse
Refurbishment
Demolition
Reconstruction

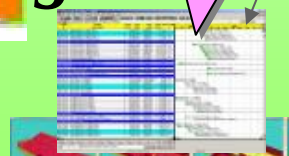


…the seamless and smarter sharing and exchanging of information via integrated technological solutions

FM
Renting, sale and use
Maintenance
Warranty

IFC

Description
Inc cost estimates



4D
Schedules
Logistics

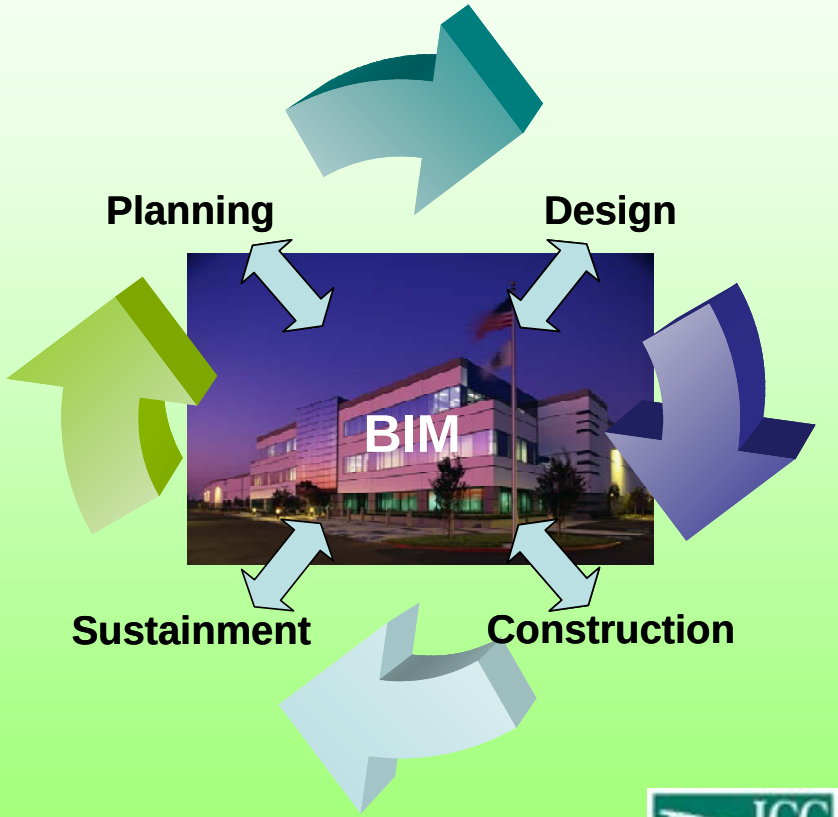
Sourcing
Product databases
Price databases

ICC
INTERNATIONAL CODE COUNCIL

Building Information Model

A digital representation of physical and functional characteristics of a building (data)

- ***… a shared knowledge source or database for intelligent information about a facility that can be maintained over time that***
- ***… stays with the building forever***
- ***… can be seamlessly used by all***
- ***… must follow an established standard if BIMs are to contain needed information in a usable format***



ICC
INTERNATIONAL CODE COUNCIL

National BIM Standard

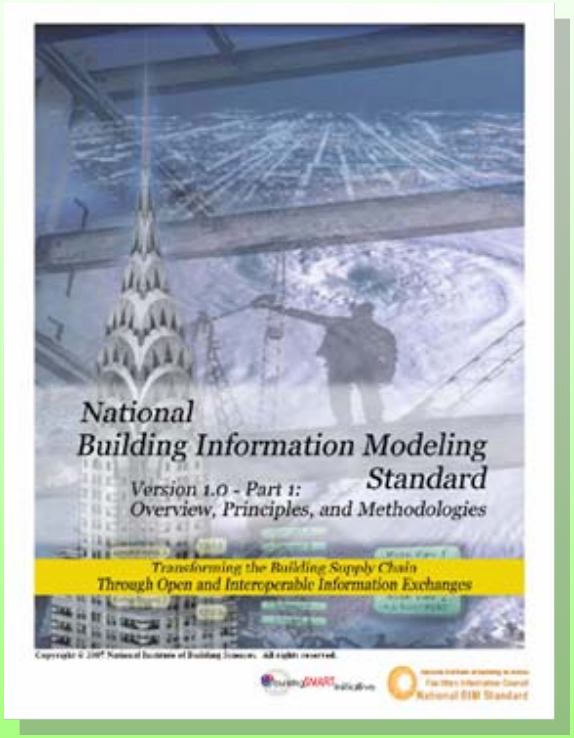
National Institute of BUILDING SCIENCES

Vision

- *Improved planning, design, construction, operation, and maintenance processes*
- *Use of a standardized machine-readable information model for each facility*
- *Availability of all appropriate information about a facility in a format useable throughout its life-cycle*

Mission

- *Improve the performance of facilities over their full life-cycle*
- *Foster a common, standard and integrated life-cycle information model*
- *Free flow of graphic and non-graphic information among all parties*
- *Coordinate U.S. efforts with related activities taking place internationally*



ICC
INTERNATIONAL CODE COUNCIL

buildingSMART

….BIM facilitated by an open standard covering information for construction (IFC)

….a way of doing planning, designing, reviewing, approving, costing, maintaining, etc. buildings better

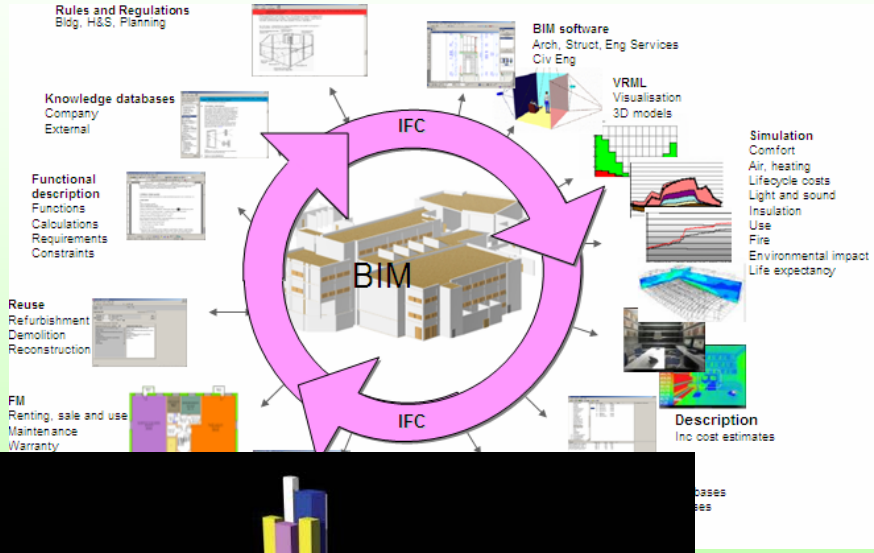
….the act of building (a verb) smart (the opposite of dumb)

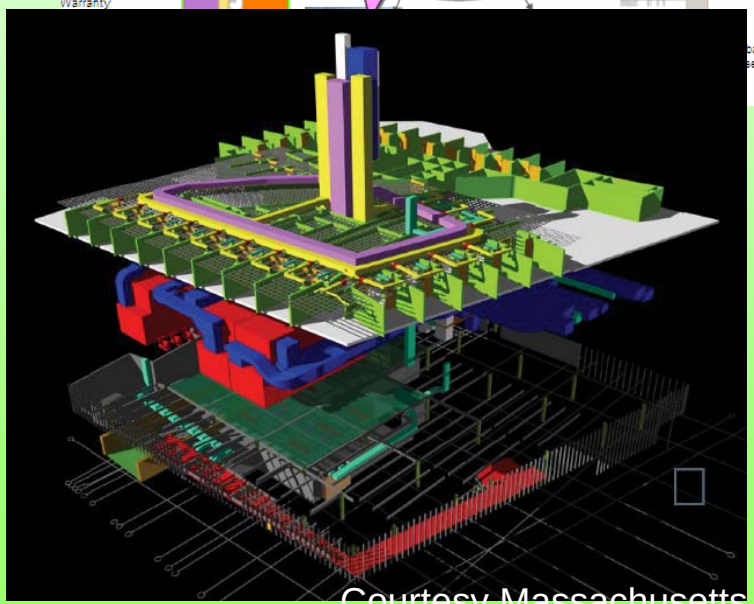
…..a concept that is becoming reality as different building interests collaborate without self-interest for the common good

ICC
INTERNATIONAL CODE COUNCIL®

A Foundation to Achieve the Best

- *Communication and collaboration*
- *More robust and timely information*
- *Transparency*
- *More informed decisions*
- *Better buildings*
- *Reduced LCC*
- *Increased productivity*
- *Complete visualization anytime*





Courtesy Massachusetts General Hospital

Safety Related Use Cases

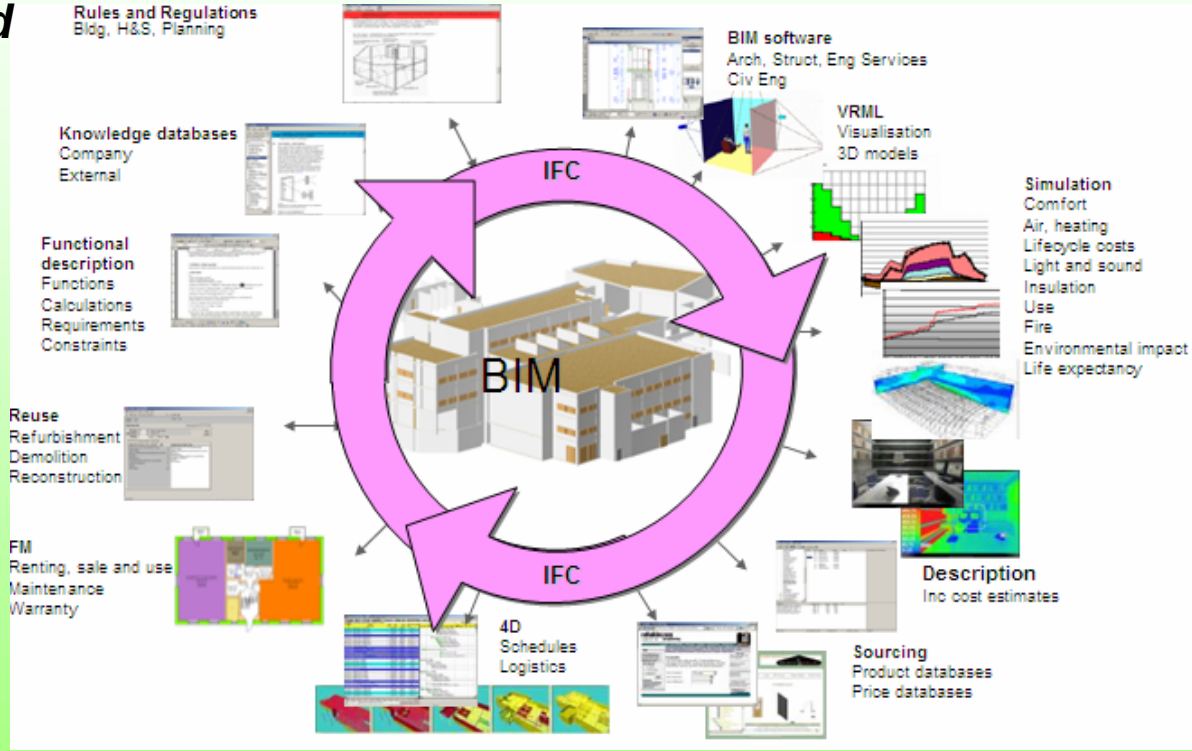
- ***Design and construction compliance with codes and regulations***

- ***Performance modeling to validate compliance with codes and regulations***

  - ***Energy***
  - ***IAQ***
  - ***Fire and smoke***

- ***Availability of as built and maintained information***

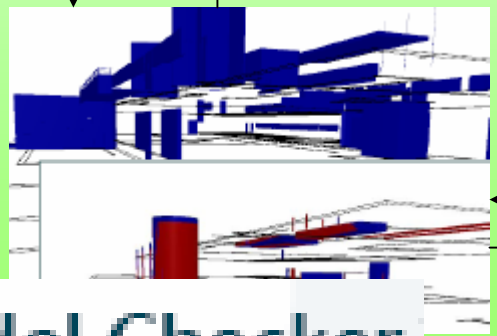
  - ***Building forensics***
  - ***Fire fighting***
  - ***Energy control***



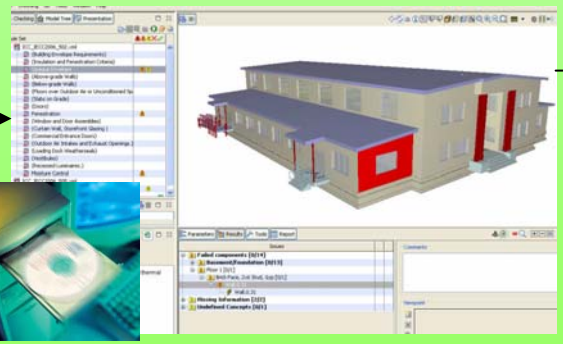
ICC INTERNATIONAL CODE COUNCIL

Design and Construction

SMARTcodes™



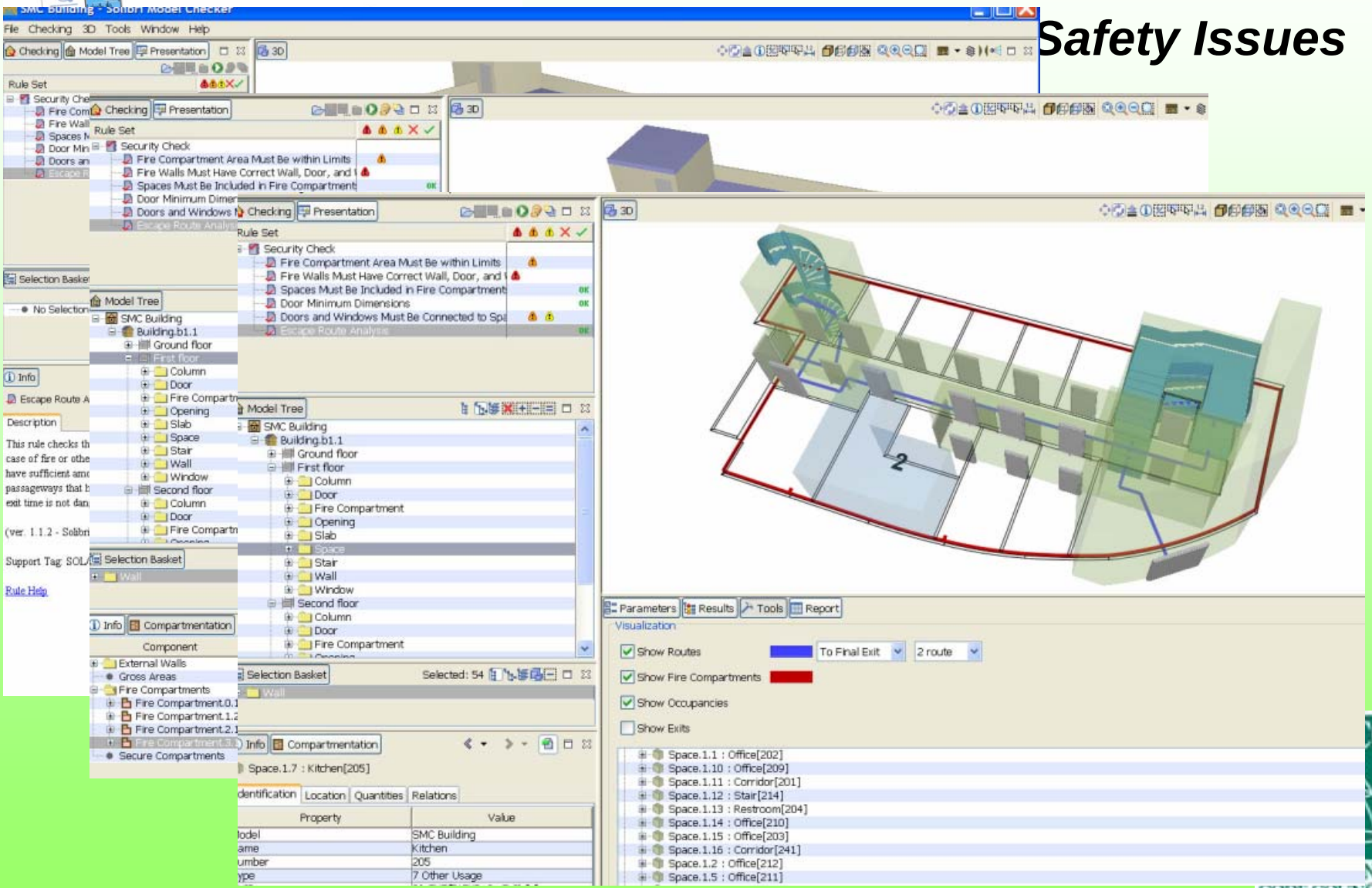
Model Checker



ICC
INTERNATIONAL CODE COUNCIL®

Design and Construction

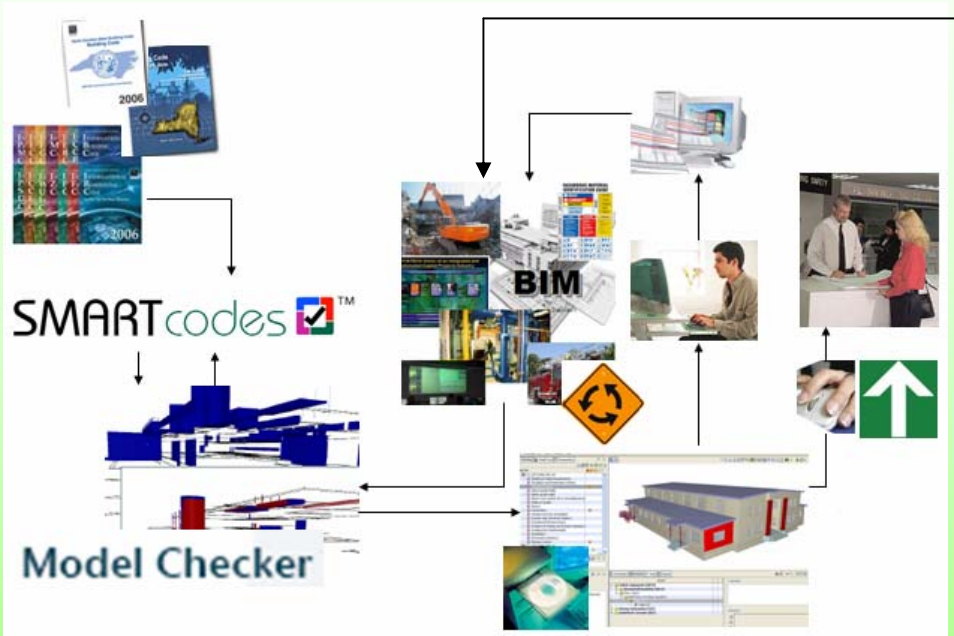
Safety Issues



Performance Modeling

ICC
INTERNATIONAL CODE COUNCIL®

As Built and Maintained



ICC
INTERNATIONAL CODE COUNCIL

Summary

Interoperability = basis for communication of data

building SMART = application and use of data

BIM = dynamic data resource

Interoperability + buildingSMART + BIM =

ICC
INTERNATIONAL CODE COUNCIL®

Questions

Dave Conover
Senior Advisor
500 New Jersey Avenue
Suite 600
Washington, DC 20001
1-888-iccsafe x 6244
www.iccsafe.org